PATENT ABSTRACTS OF JAPAN

(11)Publication number : 07-023377
(43)Date of publication of application : 24.01.1995

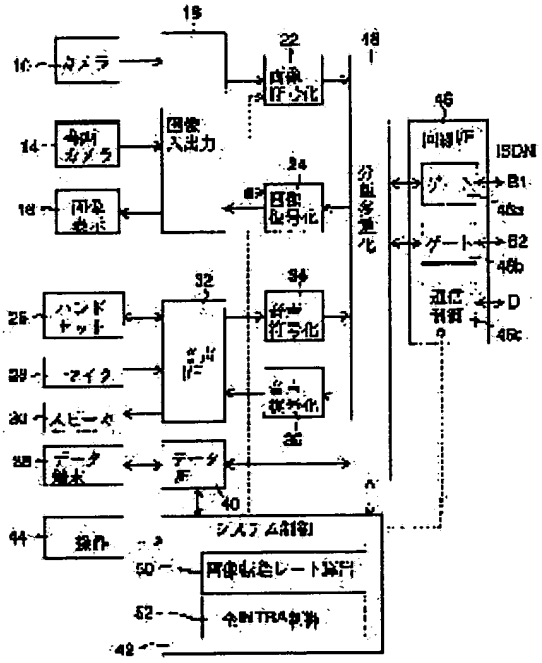
(51)Int.Cl. H04N 7/24
H04N 7/14

(21)Application number : 05-150651
(22)Date of filing : 22.06.1993

(71)Applicant : CANON INC
(72)Inventor : SENDA MAKOTO

(54) PICTURE TRANSMITTER

(57)Abstract:
PURPOSE: To prevent a picture from being deteriorated at the time of changing a picture transmission rate.
CONSTITUTION: A picture transfer rate calculating circuit 50 calculates a transfer rate allocated to picture transmission. In the case of changing the picture transfer rate, an overall INTRA control circuit 52 instructs an image encoding circuit 22 to encode all blocks in the fixed number of frames by an intra-frame encoding system. Consequently the fixed number of frames after changing the picture transfer rate are encoded by intra-frame encoding and transmitted.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

Copyright (C); 1998,2003 Japan Patent Office

(19)日本国特許庁（ＪＰ）　(12) **公開特許公報（A）**　(11)特許出願公開番号

特開平7－23377

(43)公開日　平成７年(1995)１月24日

(51)Int.Cl.[6]	識別記号	庁内整理番号	ＦＩ	技術表示箇所
Ｈ０４Ｎ　7/24				
7/14		7251－5C		
			Ｈ０４Ｎ　7/ 13　Z	

審査請求　未請求　請求項の数２　ＯＬ　（全 13 頁）

(21)出願番号　特願平5－150651

(22)出願日　平成５年(1993)６月22日

(71)出願人　000001007
キヤノン株式会社
東京都大田区下丸子３丁目30番２号

(72)発明者　千田　誠
東京都大田区下丸子３丁目30番２号キヤノン株式会社内

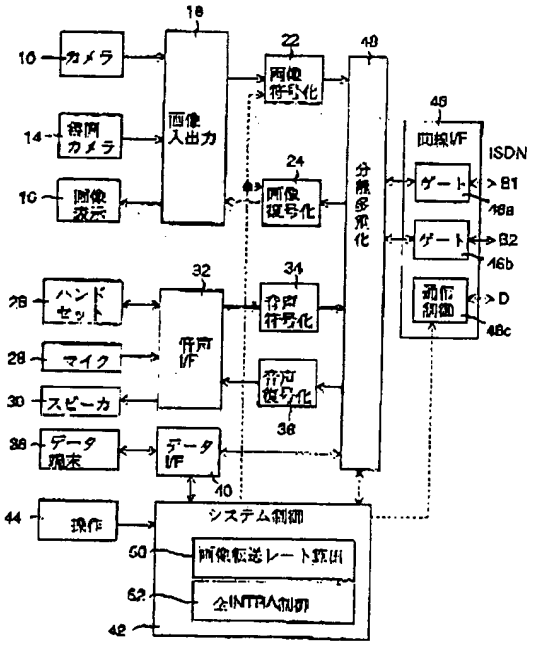
(74)代理人　弁理士　田中　常雄

(54)【発明の名称】　画像送信装置

(57)【要約】

【目的】　画像伝送レート変更時の画像の乱れを解消する。

【構成】　画像転送レート算出回路５０は、画像伝送に割り当てられる転送レートを算出する。画像転送レートの変更時、全ＩＮＴＲＡ制御回路５２は、画像符号化回路２２に指示して、一定数のフレームを、フレーム内の全ブロックをフレーム内符号化する方式で符号化させる。これにより、画像転送レートの変更後、一定数のフレームが、フレーム内符号化されて送信される。



1

【特許請求の範囲】

【請求項1】　画面内符号化及び画面間符号化を有する符号化方式により画像情報を圧縮伝送する画像送信装置であって、送信すべき画像情報を圧縮符号化する符号化手段と、画像伝送レートの変更を検出する伝送レート検出手段と、当該伝送レート検出手段の検出結果に応じて、当該符号化手段に、画面全体を画面内符号化する符号化方式で伝送レート変更後の所定数の画面を符号化させる制御手段とからなることを特徴とする画像送信装置。

【請求項2】　前記所定数が複数である請求項1に記載の画像送信装置。

【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明は、画像送信装置に関し、より具体的には、テレビ電話やテレビ会議などの画像伝送システムにおける画像送信装置に関する。

【0002】

【従来の技術】ディジタル公衆通信回線網（所謂、ＩＳＤＮ）の普及により、画像、音声及びデータの同時的な通信な可能になり、テレビ電話及びテレビ会議システムが現実的になってきた。ディジタル回線を用いた音声映像サービス用のサービス規定、プロトコル規定及びマルチメディア多重化フレーム構成規定が、国際電信電話諮問委員会（ＣＣＩＴＴ）の勧告Ｈ．３２０、Ｈ．２４２及びＨ．２２１等として発表されている。

【0003】Ｈ．３２０は、音声映像サービスの全般のシステム・アスペクトを規定する。Ｈ．２２１は、６４Ｋｂｐｓ～１．９２０Ｋｂｐｓチャネル上での音声映像伝送における、フレーム構造並びに端末能力の交換及び通信モードの指定等に使用されるＦＡＳ（Ｆｒａｍｅ Ａｌｉｇｎｍｅｎｔ Ｓｉｇｎａｌ）及びＢＡＳ（Ｂｉｔ－ｒａｔｅ Ａｌｌｏｃａｔｉｏｎ Ｓｉｇｎａｌ）の符号化割り当てを規定する。Ｈ．２４２はＢＡＳによる端末間の能力交換及び通信モード切換えのプロトコルを規定する。

【0004】上記勧告ではまた、エンド・ツー・エンドの物理コネクションの設定、並びに、インチャネルでのＦＡＳによる同期確立後、インチャネルでＢＡＳによる端末能力の交換シーケンス及び通信モードの指定によるモード切換えシーケンス等の手順により端末間で画像、音声及びデータ等の複合情報通信を行なう方法が規定されている。

【0005】なお、各端末は、自己の端末能力を状況に応じて所定範囲で変更又は選択できるようになっており、交換された能力の範囲内でどの通信モードを用いるかは、規定の範囲外である。

【0006】画像、音声及びデータを同時伝送する場合の各情報の伝送速度については、音声は音声符号の符号化方式により決定され、データは指定値に設定され、画像には、通信回線の伝送速度の中の残りの伝送能力が割り当てられる。

2

【0007】画像情報の圧縮方式としては、圧縮率を高めると共に、伝送エラーの伝搬を少なく抑えられるように、フレーム内符号化と動き補償フレーム間符号化を混在させる符号化方式が提案されている。

【0008】ディジタル公衆網は、ＩＳＤＮとして既に実用化されている。ユーザに提供されているインターフェースは、基本インターフェース（２Ｂ（６４Ｋｂｐｓ）＋Ｄ（１６Ｋｂｐｓ））と一次群インターフェース（Ｈ０（３８４Ｋｂｐｓ）、Ｈ１（１．５Ｍｂｐｓ）及び２３Ｂ＋Ｄ）である。基本インターフェースは、現在のアナログ公衆網に代わるものである。相手端末との呼接続にはアウトバンド・チャネルであるＤチャネルを使用し、音声、画像及びデータなどの情報データの伝送にはＢチャネルを使用する。Ｂチャネルは２つあるので、この２チャネル間の同期をとることにより、最高で１２８Ｋｂｐｓのデータ転送（バルク転送）が可能になる。ＴＶ電話などでは大量のデータ伝送容量が必要になるので、バルク転送は非常に有効である。

【0009】

【発明が解決しようとする課題】ＴＶ電話やテレビ会議では、画像、音声及びデータ並びに相互の制御情報を必要に応じて多重化して伝送する。従って、伝送する情報やその符号化方法の変更があると、その都度、多重化構成を変更することになる。

【0010】伝送レートの変更はＢチャネルのインチャネル制御コマンドにより受信端末に伝達されるので、伝送情報との同期をとるのが非常に難しい。送信端末の多重化変更時期と受信端末の多重化変更時期が食い違うと、受信端末で復号エラーが発生する。

【0011】特に画像データの場合、先に説明したように、１画面をある任意のブロックに分割し、そのブロック毎に前フレームの差分値を符号化して伝送するフレーム間符号化（ＩＮＴＥＲ）と、１フレーム内で符号化するフレーム内符号化（ＩＮＴＲＡ）とを併用するので、受信側では、フレーム同期が一旦乱れた後にフレーム同期がとれても、上記ブロックの全てに対して新たなフレーム内符号化画面を受信するまでは原画像を復元できない。即ち、画像伝送レートの変更があると、受信側では正常な画像を再生表示するまでにかなりの時間がかかるという欠点があった。

【0012】本発明は、このような不都合の生じない画像送信装置を提示することを目的とする。

【0013】

【課題を解決するための手段】本発明に係る画像送信装置は、画面内符号化及び画面間符号化を有する符号化方式により画像情報を圧縮伝送する画像送信装置であって、送信すべき画像情報を圧縮符号化する符号化手段と、画像伝送レートの変更を検出する伝送レート検出手

段と、当該伝送レート検出手段の検出結果に応じて、当該符号化手段に、画面全体を画面内符号化する符号化方式で伝送レート変更後の所定数の画面を符号化させる制御手段とからなることを特徴とする。

【0014】

【作用】上記手段により、画像伝送レートの変更があると、所定数の画面が、画面全体を画面内符号化しする符号化方式で圧縮して送信される。これにより、受信側端末は、画像伝送レートの変更直後に、前画面を参照せずに受信画像を復号し、表示できる。これにより、画像伝送レートの変更に伴う画像の乱れがほとんど生じなくなり、発生したとしても極く短時間で回復する。

【0015】

【実施例】以下、図面を参照して本発明の実施例を説明する。

【0016】図1は、本発明の一実施例における端末装置の概略構成ブロック図を示す。

【0017】図1において、10は会議参加者を撮影するカメラ、14は図面などの会議資料を撮影する静画カメラ、16はCRTや液晶表示装置などからなる画像表示装置、18は、カメラ10，14の出力画像を送信用に選択し、カメラ10，14の出力画像及び受信画像を選択合成して画像表示装置16に供給する画像入出力回路である。

【0018】22は、送信すべき画像信号を符号化する画像符号化回路、24は、受信した符号化画像信号を復号化する画像復号化回路である。ここでは、画像符号化回路22は、離散コサイン変換（DCT）、ベクトル量子化及び動き補償を使用するフレーム内及び間符号化、並びに脱落としにより、画像データを帯域圧縮する。ISDN回線の基本インターフェースの64Kbpsで伝送可能な符号化方式として、CCITT勧告H．261がある。

【0019】26はマイク及びスピーカからなるハンドセット、28はマイク、30はスピーカ、32はハンドセット26、マイク28及びスピーカ30に対する音声入出力インターフェースである。音声入出力インターフェース32は、ハンドセット26、マイク28及びスピーカ30の音声入出力を切り換えるだけでなく、エコー・キャンセル処理、並びに、ダイヤルトーン、呼出音、ビジー・トーン及び符信音などのトーンの生成処理を行なう。

【0020】34は、音声入出力インターフェース32からの送信すべき音声信号を符号化する音声符号化回路、36は、受信した符号化音声信号を復号化して音声入出力インターフェース32に出力する音声復号化回路である。伝送速度及び符号化方法には、64KbpsのPCM（A－law）、64KbpsのPCM（μ－law）、7KHzオーディオ（SB－ADPCM）、32KbpsのADPCM、16Kbps（例えば、LD－CELP）及び8Kbpsなどがある。

【0021】38はパーソナル・コンピュータなどのデータ端末装置、40は当該データ端末装置38を接続するためのデータ・インターフェースである。

【0022】42は全体を制御するシステム制御回路、44はシステム制御回路42に種々の指示を入力する操作装置であり、例えば、キーボード、タッチ・パネル、ディジタイザ及びマウスなどのポインティング装置からなる。

【0023】46は通信回線（例えば、ISDN回線）の回線インターフェース、48は、画像符号化回路22、音声符号化回路34及びデータ・インターフェース40からの送信すべき情報並びにシステム制御回路42からの制御情報をH．221フォーマットに多重化して回線インターフェース46に供給すると共に、回線インターフェース46から供給される受信情報から画像、音声、データ及び制御信号を分離し、それぞれ画像復号化回路24、音声復号化回路36、データ・インターフェース40及びシステム制御回路42に供給する分離多重化回路である。

【0024】本実施例では、回線インターフェース46は、2つのBチャネルの一方のチャネルB1用のゲート回路46a、他方のチャネルB2用のゲート回路46b、及び、Dチャネルを介して通信を制御する通信制御回路46cを具備する。

【0025】また、システム制御回路42は特に、画像データに割り当てられた転送レートを算出する画像転送レート算出回路50、及び1フレームの全ブロックのフレーム内符号化を強制する全INTRA制御回路52を具備する。画像転送レート算出回路50、及び全INTRA制御回路52の作用の詳細は後述する。

【0026】図1に示す実施例における画像信号及び音声信号の流れを簡単に説明する。カメラ10及び静画カメラ14による入力画像は画像入出力回路18により選択されて画像符号化回路22に印加される。画像符号化回路22は、システム制御回路42からの制御信号及び内部決定に従う符号化モードで入力画像信号を符号化し、分離多重化回路48に出力する。

【0027】他方、ハンドセット26のマイク又はマイク28による入力音声信号は音声入出力インターフェース32を介して音声符号化回路34に入力し、ここで符号化されて分離多重化回路48に入力される。

【0028】データ端末38から送信したいデータはデータ・インターフェース40を介して分離多重化回路48に入力する。また、操作装置44から入力した送信したいデータも、データ・インターフェース40を介して分離多重化回路48に入力する。

【0029】分離多重化回路48は、画像符号化回路22及び音声符号化回路34からの符号化信号、データ・インターフェース40からのデータ、並びにシステム制

5

御回路４２からの制御コマンドを多重化し、回線インターフェース４６に出力する。回線インターフェース４６は分離多重化回路４８からの信号を、接続する通信回線に所定フォーマットで出力する。

【００３０】通信回線から受信した信号は回線インターフェース４６から分離多重化回路４８に供給される。分離多重化回路４８は、受信信号から符号化画像信号、符号化音声信号、データ及び制御コマンドを分離し、それぞれ画像復号化回路２４、音声復号化回路３６、データ・インターフェース４０及びシステム制御回路４２に入力する。

【００３１】画像復号化回路２４は、分離多重化回路４８からの符号化画像信号を復号し、画像入出力回路１８に入力する。画像入出力回路１８は、カメラ１０，１４からの画像及び画像復号化回路２４からの受信画像を選択合成して画像表示装置１６に入力する。画像入出力回路１８は、合成処理として例えば、ピクチャー・イン・ピクチャーやウインドウ表示システムにおける対応ウインドウへのはめ込みなどを行なう。これにより、入力画像及び／又は受信画像が画像表示装置１６の画面に表示される。

【００３２】音声符号化回路３６により復号された受信音声信号は音声入出力インターフェース３２を介してハンドセット２６のスピーカ及び／又はスピーカ３０に印加される。これにより、通信相手からの音声を聞くことができる。

【００３３】分離多重化回路４８で分離された受信データはデータ・インターフェース４０からデータ端末３８に入力される。

【００３４】Ｈ．２６１勧告では、ＮＴＳＣ方式、ＰＡＬ方式及びディジタル・テレビジョン信号などの複数の規格間での通信を可能にするため、共通のビデオ・フォーマットが規定されている。ＣＩＦフォーマットとＱＣＩＦフォーマットである。ＣＩＦフォーマットは、標本数が輝度信号Ｙで３５２画素×２８８ライン、色差信号Ｃｒ，Ｃｂで１７６画素×１４４ラインである。ＱＣＩＦフォーマットはＣＩＦフォーマットの１／４の情報量であり、標本数が輝度信号Ｙで１７６画素×１４４ライン、色差信号Ｃｒ，Ｃｂで８８画素×７２ラインである。

【００３５】圧縮方法の要素技術としては、フレーム内の画像を８画素×８画素のブロックに区分し、そのブロックに対して二次元離散コサイン変換（ＤＣＴ変換）するフレーム内符号化、前フレームと現フレームの同位置のブロックに対してフレーム間の差分をとり二次元ＤＣＴ変換するフレーム間符号化、フレーム間の画像の動きを補償することで発生符号量を減らす動き補償、ＤＣＴ変換係数で高周波領域では一般にゼロ値が続くことを利用したゼロ・ランレングス符号化、データの発生量に応じて量子化ステップ・サイズを変更する量子化、発生頻

6

度の高いデータ・パターンに短い符号値を、発生頻度の低いデータ・パターンに長い符号値を割り当てる可変長符号化、及び、フレームをスキップする駒落としが採用されて、これらの組み合わせで高い圧縮率を達成し、低レートの通信路での動画伝送を可能にしている。

【００３６】フレーム間符号化（ＩＮＴＥＲ）モードは、フレーム間の相関が高い場合に高い圧縮率を達成できるので、フレーム間に一定以上の相関がある場合にＩＮＴＥＲモードを採用し、一定未満の相関のときフレーム内符号化（ＩＮＴＲＡ）モードを採用する。

【００３７】ＩＮＴＥＲモードでは、送信側の量子化と受信側の量子化との間の差である量子化誤差が受信側端末で累積され、量子化が粗い場合にはこれが顕著になるので、周期的にＩＮＴＲＡモードを配置するのが普通である。伝送エラーの伝搬を防ぐためにも、上記ブロック単位に周期的にＩＮＴＲＡモードが配置される。特に、画像通信の開始時などのように、差分のための参照画像が無い場合や、シーン・チェンジ（場面が切り換わることで、画面全体でフレーム間相関が無いと判断された状態）の場合に限り、フレーム内の全ブロックをフレーム内符号化する。これを全ＩＮＴＲＡ処理と呼ぶ。全ＩＮＴＲＡ処理により、復号化エラー及び量子化誤差を解消し、画面をリフレッシュできる。

【００３８】次に、ＩＳＤＮ回線を例に、端末能力のネゴシエーションとその変更の方法を説明する。ＩＳＤＮ回線では、図２に示すように、アウトバンド信号（つまり、Ｄチャネル）を用いて発呼する。図２に示すように、端末Ａから端末Ｂへの呼設定と、端末Ｂから端末Ａへの応答でＢチャネルでの通信が可能になる。通信路としては他にＤチャネル、Ｈ０，Ｈ１などもあるがＢチャネルのみで説明する。

【００３９】このようにして通信可能になったＢチャネルを用いて、勧告Ｈ．２４２に従い、図３に示すようにインバンド信号手順がＢチャネルで実行され、これによりＢチャネル内をデータ部と通信を制御する制御部に割り付ける。インチャネルの制御部による制御はインチャネル制御と呼ばれる。インンチャネル制御のためにＢチャネル内に制御ビットが必要になり、そのフレーム構成が勧告Ｈ．２２１で規定されている。

【００４０】インチャネル制御を実行するためのＢチャネル内のフレーム構成を図４に示す。図４は、Ｂチャネル（６４Ｋｂｐｓ）に対するマルチフレーム構造を示す。このマルチフレーム構造は、１オクテット／１２５μｓを基本として、図４（ａ）に示すように１フレームが８０オクテット、同（ｂ）に示すように１サブマルチフレームが２フレーム、同（ｃ）に示すように１マルチフレームが８サブマルチフレームとなる。ビット方向には、８Ｋｂｐｓの８つのサブチャネル＃１～＃８が定義される。

【００４１】但し、サブチャネル＃８だけは、転送レー

トが6．4Kbpsになり、制御ビットとしてFAS（Pramc Alignment Signal）及びBAS（Bit-rate Allocation Signal）の信号が挿入されている。このFAS及びBASにより、Bチャネルのインチャネル制御が可能になる。

【0042】なお、FASはフレーム及びマルチフレーム同期に利用される。BASは、サブチャネルなどの多重方法を決定するのに必要な端末能力の情報の交換又は能力設定に使用される。特に、BASは、データ通信中であってもサブマルチフレーム（20ms）毎に切り換えることができる。

【0043】図3に示すインバンド信号手順を簡単に説明する。Bチャネルが通信可能状態になると、端末A、Bは共に、FASを送信する。このときの端末能力は、初期状態のモード0（音声と、FAS及びBASのみのモード）である。このFASは、相手端末で探索され、H．242で規定されたフレーム同期確立の条件が満たされると、図5に示すFAS内のビット構成のAを"0"にして送信する。A＝0を端末が受信することで、相手端末がフレーム同期を確立したことが確認される。

【0044】次に、自端末の能力情報をBASで相手端末に送信し、互いに相手端末の能力を確認する。もしこの時点で互いに通信可能であれば、データの通信が開始される。能力変更が必要な場合には、同様にBASを用いてコマンドとして端末能力を送信し、相手端末がその能力の設定を完了した後、データの通信を開始する。

【0045】データの通信は送信と受信が独立しており、同期の確立も端末能力の設定も別々に行なわれる。従って、片方向だけ同期が外れたり、送信と受信でデータの種類が異なることもある。

【0046】データの通信が完了し、呼を切断するときには、先ず、切断する側の端末（図4では端末A）がBASを用いてモード0にする。これにより、Bチャネルのインチャネル制御は初期状態に戻る。次に、図2に示すようにDチャネルのアウトバンド手順で、切断と解放が行なわれて、全ての通信が完了する。

【0047】図5は、FAS内のビット構成を示す。ビットAはフレーム同期外れの有無を示し、Eビットは CRC誤りの発生の有無を示す。C1，C2，C3，C4はCRC4のビットである。N1～N5はマルチフレームの番号付け用、R1～R4はチャネル番号である。TEAは端末装置アラームであり、端末内部の故障により受信信号に応答できないときに"1"にセットされる。

【0048】図6は、BAS内のビット構成を示す。図6（a）に示すように、上位3ビットは属性を表わし、残り5ビットはその属性の属性値を示す。図6（b）は属性の内容を示す。属性値には例えば、転送レート値、コーディック種別、各メディア又は情報特有のパラメータ値などがある。

【0049】図7、図8、図9、図10及び図11は全体として、本実施例の特徴的な動作のフローチャートを示す。ここで、Xは情報伝送に確保した転送レート、Yは転送レートXから音声データ転送に確保した転送レートを差し引いた転送レート、Zは転送レートYからデータ（LSD，HSD）の転送レートを差し引いた転送レート、Zpは送信能力変更前の転送レートZである。

【0050】先ず、通信開始処理として、X，Y，Z，Zpを0で初期化し、送信能力の変更時などに伝送する全INTRAフレーム（全ブロックをフレーム内符号化したフレーム）のフレーム数を設定する（S1）。

【0051】画像、音声及びデータを扱う複合情報端末か否かを調べ（S2）、複合情報端末でなければ、音声のみの通常の電話か否かを調べる（S3）。電話としての通信の場合（S3）、Dチャネルでの呼制御により相手端末と接続し（S4）、Bチャネルを接続する（S5）。音声部を起動状態にし（S6）、切断操作まで回線を維持する（S7）。切断操作により（S7）、回線を切断する（S8）。なお、電話でも無い場合（S3）、その他の端末処理を実行する（S9）。

【0052】複合情報端末の場合（S2）、Dチャネルでの呼制御により相手端末と接続し（S10）、Bチャネルを接続する（S11）。Bチャネルのインチャネル制御を開始し（S12）、FASの同期を検出する（S13）。FASの同期が確立したら（S13）、BASによる能力のネゴシエーションで相手端末の能力を確認する（S14）。

【0053】相手端末に音声能力があれば（S15）、操作者による音声送信要求に応じて（S16）、音声部を起動する（S17，18）。確保したBチャネルの転送レートXから音声データの転送レートAを減算し（S19）、減算結果であるYが正であるか否か、即ち、画像又はデータを転送する余裕があるか否かを調べる（S20）。Yが正でなければ（S20）、データ部及び画像符号化部を停止し（S21）、S49に進む。Yが正であれば（S20）、相手端末のデータ能力の有無を判別する（S25）。

【0054】相手端末に音声能力が無い場合（S15）、又は操作者による音声送信要求が無い場合（S16）、音声部を停止し（S22，23）、YにXを代入する（S24）。即ち、確保したBチャネルの転送レートXを画像とデータの転送用に割り当てる。この後、相手端末のデータ能力の有無を判別する（S25）。

【0055】相手端末にデータ能力があれば（S25）、操作者によるデータ送信要求に応じて（S26）、データ部を起動する（S27，25）。利用できる転送レートYからデータの転送レートBを減算し（S29）、減算結果であるZが正であるか否か、即ち、画像を転送する余裕があるか否かを調べる（S30）。Zが正でなければ（S30）、画像符号化部を停止し（S

9

31）、S49に進む。Zが正であれば（S30）、相手端末の画像能力の有無を判別する（S35）。

【0056】相手端末にデータ能力が無い場合（S25）、又は操作者によるデータ送信要求が無い場合（S26）、データ部を停止し（S32，33）、ZにYを代入する（S34）。即ち、利用できる転送レートYを画像転送用に割り当てる。この後、相手端末の画像能力の有無を判別する（S35）。

【0057】相手端末に画像能力があれば（S35）、操作者による画像送信要求に応じて（S36）、画像符号化部を起動する（S37，38）。ZとZpの比較により画像転送レートに変更があるか否かを調べ（S39）、Z≠Zp、即ち、変更があれば（S39）、全INTRAフレームを規定フレーム数送信して（S40，41）、ZpをZで更新し（S42）、この後、通常通りに画像情報を符号化処理する（S43）。画像転送レートに変更がない場合も（S39）、通常通りに画像情報を符号化処理する（S43）。S43の後、S46に進む。

【0058】操作者による画像送信要求が無い場合（S36）、画像符号化部を停止する（S44，45）。

【0059】相手端末に画像能力が無い場合（S35）、操作者から伝送能力の変更要求があると（S46）、能力の変更を相手端末に通知し（S47）、変更内容にBチャネルの追加があれば（S53）、Bチャネルの接続を追加し（S54）、Bチャネルの削減があれば（S55）、Bチャネルの接続を削減し（S56）、以後、S14以降を繰り返す。

【0060】切断要求があり（S48）、それが相手端末からのものであれば（S49）、相手端末からのBASコマンドによるモード0への遷移の通知に従い、音声のみを扱うモード0に遷移する（S50）。また、切断要求が自端末からのものであれば（S49）、相手端末へBASコマンドによりモード0への遷移を通知し、自端末をモード0にする（S51）。S50，51の後、Dチャネル制御により回線の切断処理を実行する（S52）。

【0061】受信側端末は、送信側端末の上記動作を特に認識する必要はなく、また、受信側端末に特定の機能を追加する必要もない。

10

【0062】本実施例では、S39～42により、画像転送レートの変更時にも、画像の乱れが生じなくなり、仮に生じても極く短時間で復旧する。

【0063】

【発明の効果】以上の説明から容易に理解できるように、本発明によれば、画像伝送レートの変更があっても、伝送画像の乱れを大幅に抑制でき、伝送画像が早期に復旧する。また、送信側端末を勧告の範囲内で制御するだけなので、勧告に準拠する全ての受信端末と通信できるという利点がある。

【図面の簡単な説明】

【図1】　本発明の一実施例の概略構成ブロック図である。

【図2】　呼の設定から切断の手順を示す図である。

【図3】　インチャネル制御手順を示す図である。

【図4】　H．221のフレーム構成の説明図である。

【図5】　FASのビット構成図である。

【図6】　BASのビット構成図である。

【図7】　本実施例の動作フローチャートの一部である。

【図8】　本実施例の動作フローチャートの一部である。

【図9】　本実施例の動作フローチャートの一部である。

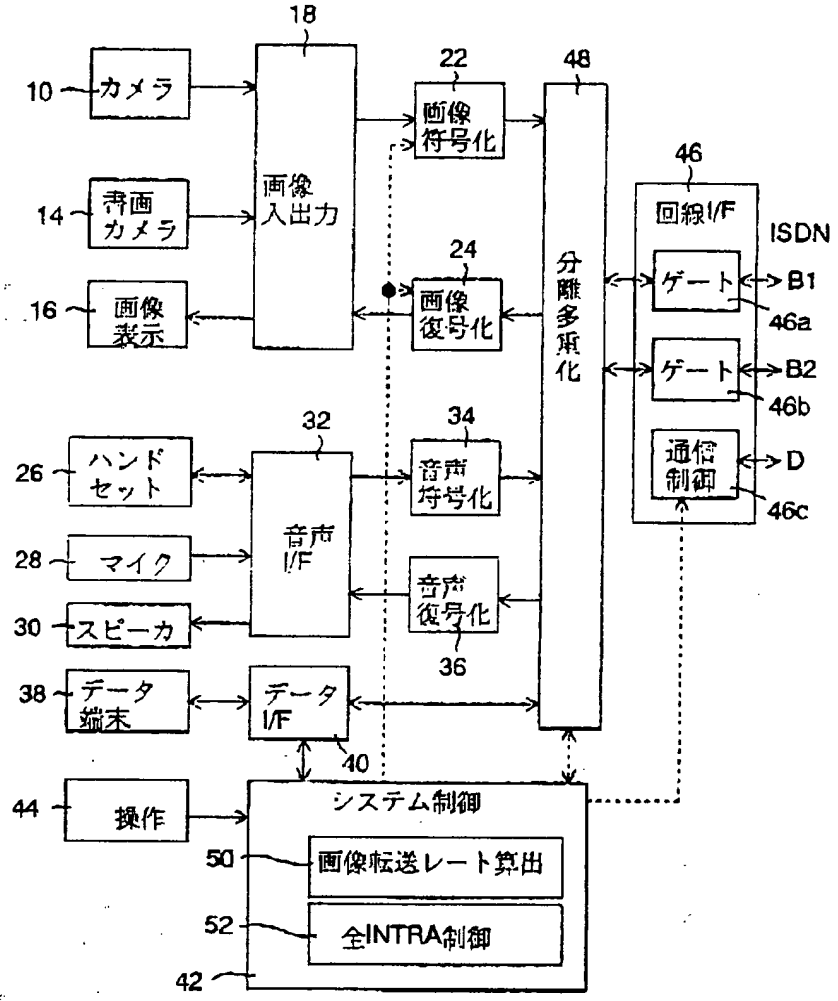
【図10】　本実施例の動作フローチャートの一部である。

【図11】　本実施例の動作フローチャートの一部である。

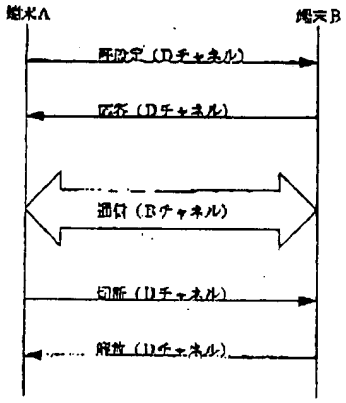
【符号の説明】

10：カメラ　14：静画カメラ　16：画像表示装置　18：画像入出力回路　22：画像符号化回路　24：画像復号化回路　26：ハンドセット　28：マイク　30：スピーカ　32：音声入出力インターフェース　34：音声符号化回路　36：音声復号化回路　38：データ端末　40：データ・インターフェース　42：システム制御回路　44：操作装置　46：回線インターフェース　46a，46b：ゲート回路　46c：通信制御回路　48：分離多重化回路　50：画像転送レート算出回路　52：全INTRA制御回路

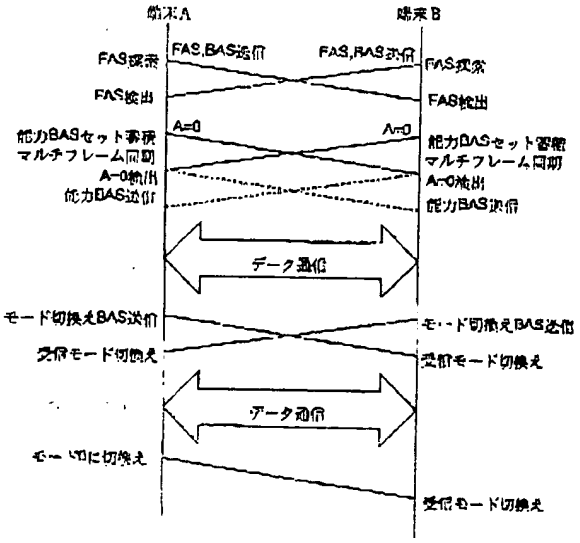
【図1】


18
10
カメラ
画像
入出力
22
画像
符号化
48
46
回線I/F
ISDN
14
書画
カメラ
24
分
離
多
重
化
ゲート
B1
46a
16
画像
表示
画像
復号化
ゲート
B2
46b
32
34
通信
制御
D
46c
26
ハンド
セット
音声
符号化
音声
I/F
28
マイク
音声
復号化
30
スピーカ
36
38
データ
端末
データ
I/F
40
システム制御
44
操作
50
画像転送レート算出
52
全INTRA制御
42

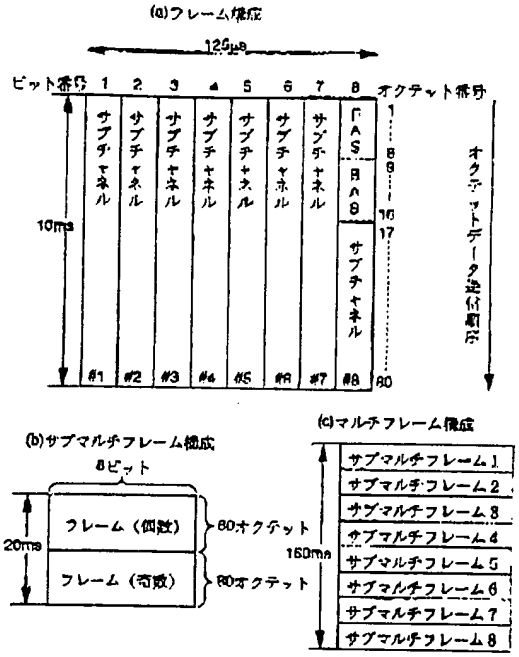
【図2】


端末A
端末B
呼設定（Dチャネル）
応答（Dチャネル）
通信（Bチャネル）
切断（Dチャネル）
解放（Dチャネル）

【図3】



【図4】



【図5】

フレーム	各フレームのサービスチャネルの番号							
	1	2	3	4	5	6	7	8
偶数フレーム	Xeven	0	0	1	1	0	1	1
奇数フレーム	Xodd	1	A	E	C1	C2	C3	C4

(a)

フレーム番号	1	3	5	7	9	11	13	15
Xodd	N1	N2	N3	N4	N5	R1	R2	TEA

(b)

フレーム番号	0	2	4	6	8	10	12	14
Xeven	0	0	1	0	1	1	R3	R4

(c)

【図6】

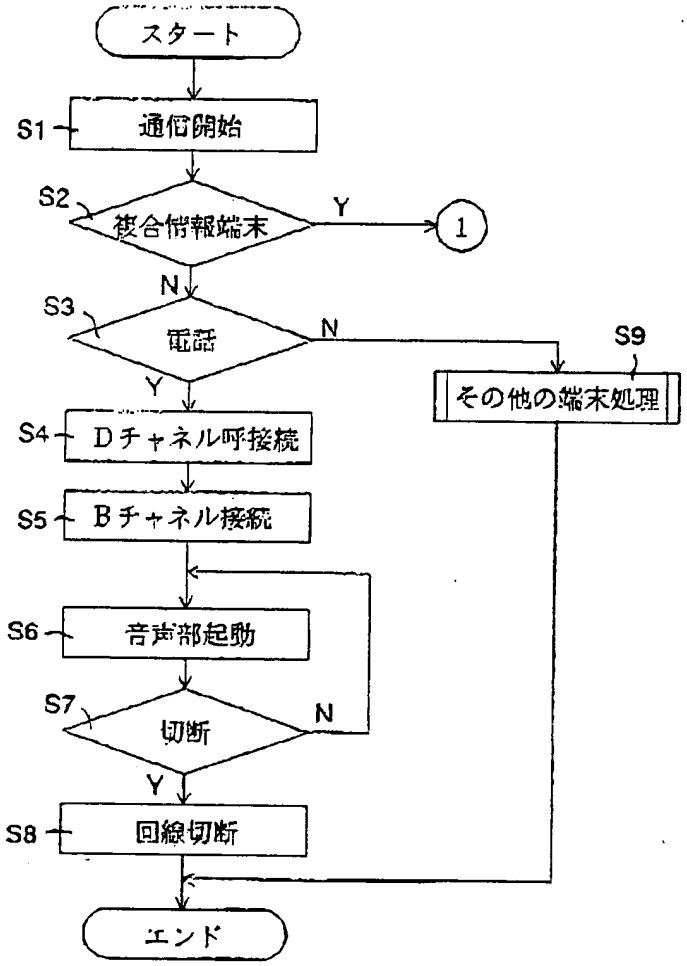
ビット番号	b0	b1	b2	b3	b4	b5	b6	b7
BAS内容	属性			属性値				

(a)

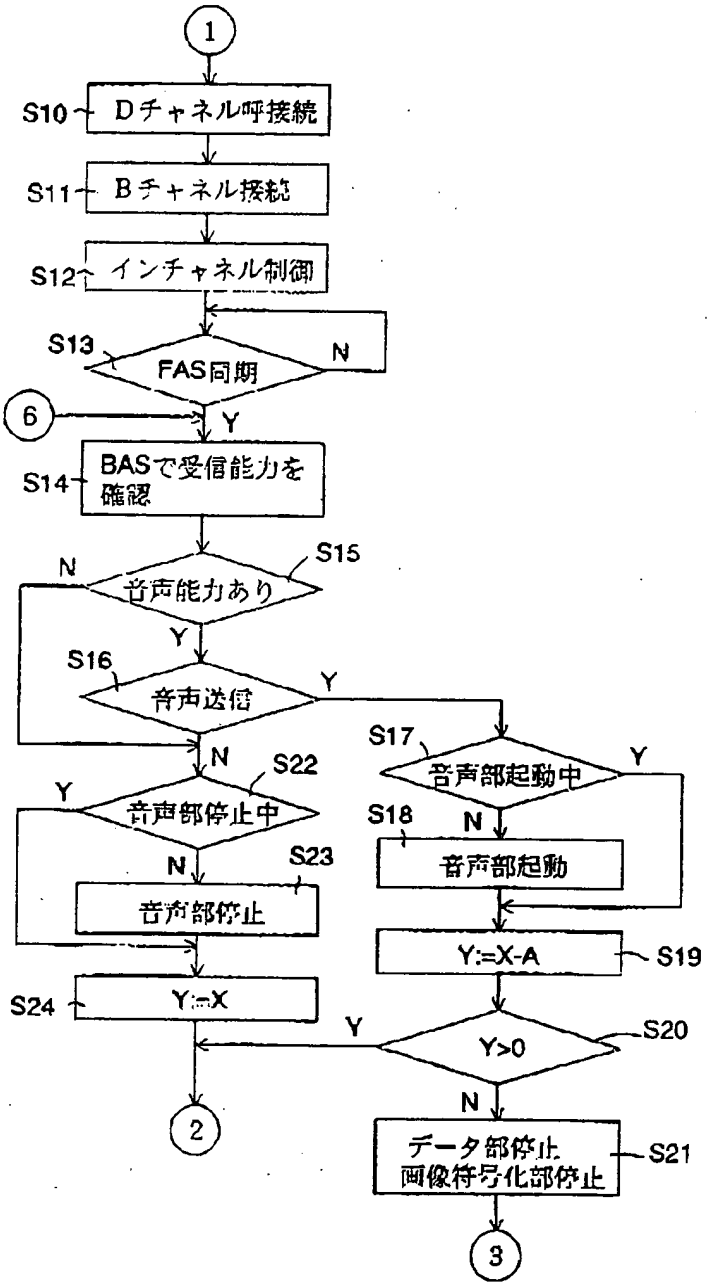
b0	b1	b2	コマンド又は能力
0	0	0	音声符号化コマンド
0	0	1	転送レートコマンド
0	1	0	映像とその他のコマンド
0	1	1	データコマンド
1	0	0	端末能力1
1	0	1	端末能力2
1	1	0	未定義
1	1	1	エスケープ符号

(b)

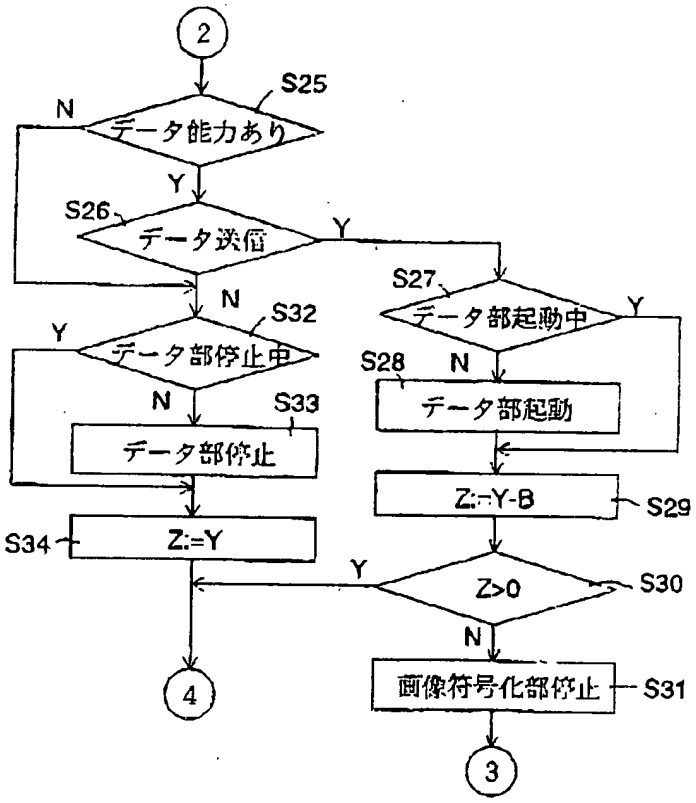
【図7】


スタート
S1
通信開始
S2
複合情報端末
Y
1
N
S3
電話
N
S9
その他の端末処理
Y
S4
Dチャネル呼接続
S5
Bチャネル接続
S6
音声部起動
S7
切断
N
Y
S8
回線切断
エンド

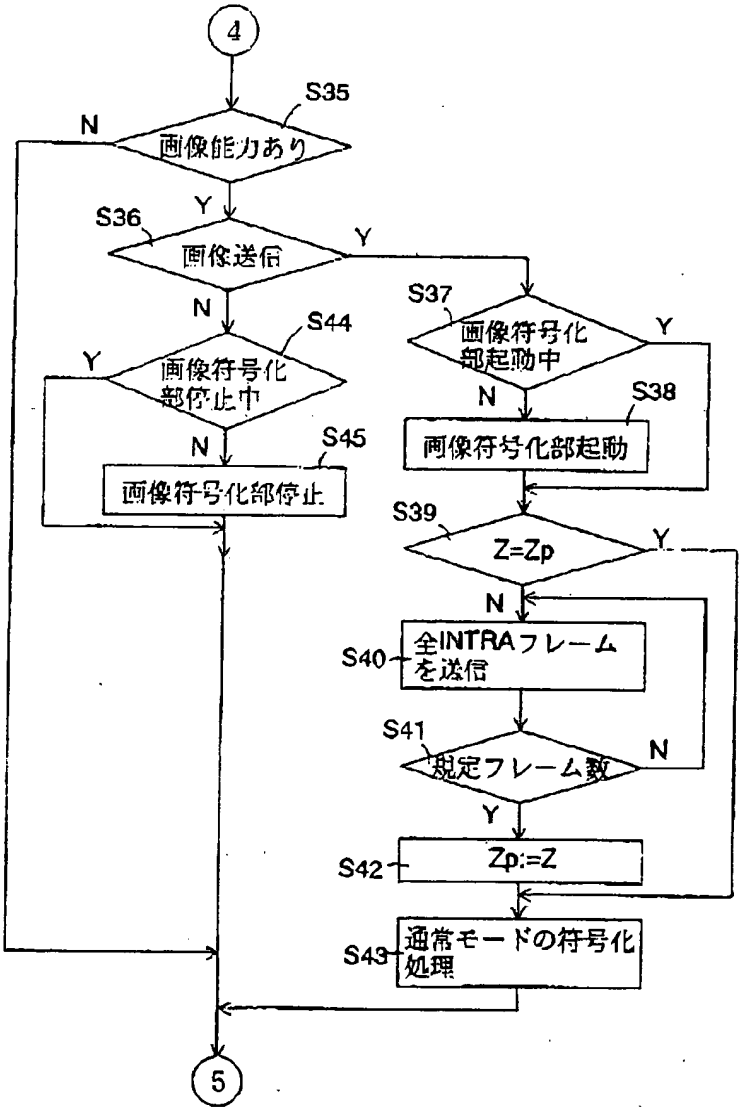
【図8】


1
S10
Dチャネル呼接続
S11
Bチャネル接続
S12
インチャネル制御
S13
FAS同期
N
Y
6
S14
BASで受信能力を確認
S15
音声能力あり
N
Y
S16
音声送信
Y
N
S17
音声部起動中
Y
S18
N
音声部起動
S22
音声部停止中
Y
N
S23
音声部停止
Y:=X-A
S19
S24
Y:=X
Y
Y>0
S20
N
2
データ部停止
画像符号化部停止
S21
3

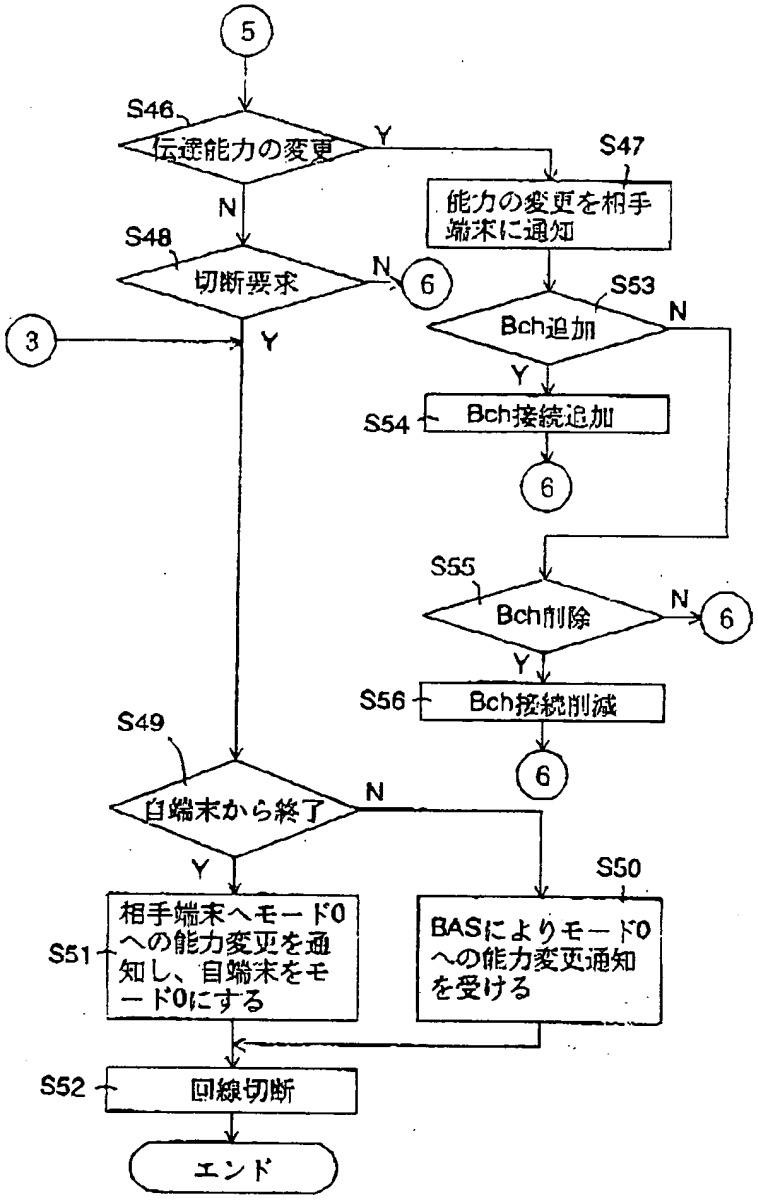
【図9】


2
S25
N
データ能力あり
Y
S26
データ送信
Y
N
S27
データ部起動中
Y
S32
Y
データ部停止中
S28
N
N
S33
データ部停止
データ部起動
Z:=Y-B
S29
S34
Z:=Y
Y
Z>0
S30
N
4
画像符号化部停止
S31
3

【図10】


4
S35
画像能力あり
N
Y
S36
画像送信
Y
N
S44
画像符号化部停止中
Y
N
S45
画像符号化部停止
S37
画像符号化部起動中
Y
N
S38
画像符号化部起動
S39
Z=Zp
Y
N
S40
全INTRAフレームを送信
S41
規定フレーム数
N
Y
S42
Zp:=Z
S43
通常モードの符号化処理
5

【図11】


5
S46
伝達能力の変更
Y
S47
能力の変更を相手端末に通知
N
S48
切断要求
N
6
S53
Bch追加
N
3
Y
Y
S54
Bch接続追加
6
S55
Bch削除
N
6
Y
S56
Bch接続削減
6
S49
自端末から終了
N
Y
S50
S51
相手端末へモード0への能力変更を通知し、自端末をモード0にする
BASによりモード0への能力変更通知を受ける
S52
回線切断
エンド

* NOTICES *

JPO and NCIPI are not responsible for any
damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] The image sending set carry out becoming from the coding means which is the image sending set which carries out compression transmission of the image information with the coding method which has coding in a screen, and coding between screens, and carries out compression coding of the image information which should transmit, the transmission rate detection means detect modification of a picture transmission rate, and the control means which make the coding means concerned encode the screen of the predetermined number after transmission rate modification according to the detection result of the transmission rate detection means concerned by the coding method encode the whole screen in a screen as the description.
[Claim 2] The image sending set according to claim 1 said whose predetermined number is plurality.

[Translation done.]

* NOTICES *

JPO and NCIPI are not responsible for any
damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] More specifically, this invention relates to the image sending set in picture transmission systems, such as a TV phone and a television conference, about an image sending set.
[0002]
[Description of the Prior Art] by the spread of digital public communication channel networks (the so-called ISDN), an image, voice, and data are instantaneous -- **** -- it becomes possible and a TV phone and a video conference system are becoming realistic. The service convention for voice image service using a digital circuit, protocol specification, and a multimedia multiplexing frame structure convention are announced as advice H.320 of the Consulting Committee of International Telegraph & Telephone (CCITT), H.242, and H.221 grade.
[0003] H.320 specifies the whole system aspect of voice image service. H. 221 specifies the coding assignment of FAS (Frame Alignment Signal) and BAS (Bit-rate Allocation Signal) in voice image transmission on a 64Kbps ~ 1,920Kbps channel used for a frame structure list by exchange of clearance capacity, assignment of the communicate mode, etc. H. 242 specifies the protocol of the capacity exchange between the terminals by BAS, and a communicate mode change.
[0004] After being synchronous established [which is depended FAS] by the in channel, the approach procedures, such as an exchange sequence of the clearance capacity by BAS and a mode change sequence by assignment of the communicate mode, perform the compound information communication link of an image, voice, data, etc. between terminals by the in channel is prescribed to setting out of the physical connection of end to end, and a list by the above-mentioned advice again.
[0005] or [in addition, / that which communicate mode is used for each terminal within the limits of the capacity to have embraced the situation, to be able to change or choose self clearance capacity now in the predetermined range, and it to have been exchanged] -- a convention -- being out of range .
[0006] About the transmission speed of each information in the case of transmitting an image, voice, and data simultaneously, voice is determined by the coding method of a voice sign, data are set as an assignment value and the remaining transmission capacity in the transmission speed of a communication line is assigned to an image.
[0007] As a compression method of image information, while raising compressibility, the coding method which makes coding in a frame and motion compensation interframe coding intermingled is proposed so that propagation of a transmission error can be suppressed few.
[0008] The digital public network is already put in practical use as ISDN. The

interfaces with which the user is provided are a basic interface (2B(64Kbps)+D (16Kbps)) and a primary group interface (H0 (384Kbps), H1 (1.5Mbps), and 23 B+D). A basic interface is replaced with a current analog public network. D channel which is an out band channel is used for call connection with a partner terminal, and B channel is used for transmission of information data, such as voice, an image, and data. Since there are two B channels, the data transfer (bulk transfer) of 128Kbps becomes possible by the highest by taking the synchronization for these two channels. Since the data transmission capacity of a large quantity is needed by TV telephone, the bulk transfer is dramatically effective.

[0009]

[Problem(s) to be Solved by the Invention] At TV telephone or a television conference, mutual control information is multiplexed and transmitted to an image, voice, and a data list if needed. Therefore, when there is modification of the information to transmit and its coding approach, a multiplexing configuration will be changed each time.

[0010] Since modification of a transmission rate is transmitted to an accepting station by the Inn channel-control command of B channel, it is dramatically difficult for it to take the synchronization with transmission information. If the multiplexing modification stage of a transmit terminal and the multiplexing modification stage of an accepting station cross, a decode error will occur with an accepting station.

[0011] especially in the case of image data, it explained previously -- as -- one screen -- the block of a certain arbitration -- dividing -- the block of every -- the difference of a before frame -- with the interframe coding (INTER) which encodes and transmits a value Since coding (INTRA) in a frame encoded within one frame is used together, even if it can take frame synchronization once frame synchronization is confused, by the receiving side, a subject-copy image cannot be restored until it receives the new coding screen in a frame to all the above-mentioned blocks. That is, when there was modification of a picture transmission rate, in a receiving side, there was a fault of taking most time amount before carrying out the repeat display of the normal image.

[0012] This invention aims at showing the image sending set which such inconvenience does not produce.

[0013]

[Means for Solving the Problem] The coding means which the image sending set concerning this invention is an image sending set which carries out compression transmission of the image information with the coding method which has coding in a screen, and coding between screens, and carries out compression coding of the image information which should transmit, It is characterized by consisting of a transmission rate detection means to detect modification of a picture transmission rate, and a control means which makes the screen of the predetermined number after transmission rate modification encode according to the detection result of the transmission rate detection means concerned by the coding method which encodes the whole screen in a screen for the coding means concerned.

[0014]

[Function] With the above-mentioned means, if there is modification of a picture transmission rate, the screen of a predetermined number will compress the whole screen by the coding method encoded in a screen, and it is transmitted. Thereby, a receiving-side terminal can decode and display a receiving image immediately after modification of a picture transmission rate, without referring to a before screen. Even if turbulence of the image accompanying modification of a picture

transmission rate stops almost arising and it generates by this, it recovers in a **** short time.

[0015]

[Example] Hereafter, the example of this invention is explained with reference to a drawing.

[0016] Drawing 1 shows outline configuration block drawing of the terminal unit in one example of this invention.

[0017] In drawing 1 , the camera with which 10 photos a board participant, the paintings-and-calligraphic-works camera with which 14 photos records, such as a drawing, the image display device with which 16 consists of CRT, a liquid crystal display, etc., and 18 are image I/O circuits which choose the output image of cameras 10 and 14 as transmission, carry out selection composition of the output image and receiving image of cameras 10 and 14, and are supplied to an image display device 16.

[0018] The image coding network which encodes the picture signal which 22 should transmit, and 24 are image decryption circuits which decrypt the received coded-image signal. Here, the image coding network 22 carries out the band compression of the image data to the inside of the frame which uses a discrete cosine transform (DCT), vector quantization, and a motion compensation, and between coding and a list by piece dropping. There is CCITT advice H.261 as a coding method which can be transmitted by 64Kbps(es) of the basic interface of an ISDN circuit.

[0019] The hand set with which 26 consists of a microphone and a loudspeaker, and 28 are the voice-input/output interfaces to as opposed to [as opposed to / in a microphone and 30 / a loudspeaker] a hand set 26, a microphone 28, and a loudspeaker 30 in 32. The voice-input/output interface 32 not only switches the voice input/output of a hand set 26, a microphone 28, and a loudspeaker 30, but performs generation processing of tones, such as a dial tone, ringing tone, a busy tone, and a ringer tone, in echo cancellation processing and a list.

[0020] The voice coding network which encodes the sound signal which 34 should transmit from the voice-input/output interface 32, and 36 are voice decryption circuits which decrypt the received coding sound signal and are outputted to the voice-input/output interface 32. There are PCM (A-law) of 64Kbps, PCM (micro-law) of 64Kbps, a 7kHz audio (SB-ADPCM), ADPCM of 32Kbps, 16Kbps (for example, LD-CELP), 8Kbps(es), etc. in transmission speed and the coding approach.

[0021] It is a data interface for 38 to connect Data Terminal Equipments, such as a personal computer, and for 40 connect Data Terminal Equipment 38 concerned.

[0022] The system control circuit where 42 controls the whole, and 44 are manual operating devices which input various directions into the system control circuit 42, for example, it consists of pointing equipments, such as a keyboard, a touch panel, a digitizer, and a mouse.

[0023] 46 the circuit interface of a communication line (for example, ISDN circuit) and 48 While multiplexing the control information from the system control circuit 42 to H.221 format at the information list which should transmit from the image coding network 22, the voice coding network 34, and the data interface 40 and supplying the circuit interface 46 It is the separation multiplexing circuit which separates an image, voice, data, and a control signal from the receipt information supplied from the circuit interface 46, and is supplied to the image decryption circuit 24, the voice decryption circuit 36, the data interface 40, and the system control circuit 42, respectively.

[0024] In this example, the circuit interface 46 possesses gate circuit 46a for one channel B1 of two B channels, gate circuit 46b for channel B-2 of another side, and communications control circuit 46c that controls a communication link

through D channel.
[0025] Moreover, especially the system control circuit 42 possesses the image transfer rate calculation circuit 50 which computes the transfer rate assigned to image data, and all the INTRA control circuits 52 that force coding in a frame of the whole block of one frame. The detail of an operation of the image transfer rate calculation circuit 50 and all the INTRA control circuits 52 is mentioned later.
[0026] The flow of the picture signal in the example shown in drawing 1 and a sound signal is explained briefly. The input image with a camera 10 and the paintings-and-calligraphic-works camera 14 is chosen by the image I/O circuit 18, and is impressed to the image coding network 22. The image coding network 22 encodes an input picture signal in the coding mode in which a control signal and internal decision are followed from the system control circuit 42, and outputs it to the separation multiplexing circuit 48.
[0027] On the other hand, the input sound signal with the microphone or microphone 28 of a hand set 26 is inputted into the voice coding network 34 through the voice-input/output interface 32, and it encodes here and it is inputted into the separation multiplexing circuit 48.
[0028] Data to transmit from a data terminal 38 are inputted into the separation multiplexing circuit 48 through the data interface 40. Moreover, the data inputted from the manual operating device 44 to transmit are also inputted into the separation multiplexing circuit 48 through the data interface 40.
[0029] The separation multiplexing circuit 48 multiplexes the control command from the system control circuit 42 in the coded signal from the image coding network 22 and the voice coding network 34, the data from the data interface 40, and a list, and outputs it to the circuit interface 46. The circuit interface 46 outputs the signal from the separation multiplexing circuit 48 to the communication line to connect in a predetermined format.
[0030] The signal received from the communication line is supplied to the separation multiplexing circuit 48 from the circuit interface 46. The separation multiplexing circuit 48 separates a coded-image signal, a coding sound signal, data, and control command from an input signal, and inputs them into the image decryption circuit 24, the voice decryption circuit 36, the data interface 40, and the system control circuit 42, respectively.
[0031] The image decryption circuit 24 decodes the coded-image signal from the separation multiplexing circuit 48, and inputs it into the image I/O circuit 18. The image I/O circuit 18 carries out selection composition, and inputs the image from cameras 10 and 14, and the receiving image from the image decryption circuit 24 into an image display device 16. The image I/O circuit 18 performs for example, a picture Inn picture, fitting to the response window in a window display system, etc. as synthetic processing. Thereby, an input image and/or a receiving image are displayed on the screen of an image display device 16.
[0032] The receiving sound signal decoded by the voice coding network 36 is impressed to the loudspeaker and/or loudspeaker 30 of a hand set 26 through the voice-input/output interface 32. Thereby, the voice from a communications partner can be heard.
[0033] The received data separated in the separation multiplexing circuit 48 are inputted into a data terminal 38 from the data interface 40.
[0034] By H.261 advice, in order to enable the communication link between the specification of plurality, such as NTSC system, a PAL system, and a digital television signal, the common video format is specified. They are a CIF format and a QCIF format. The sample size of a CIF format is 176 pixel x144 line in 352 pixel x288 line and color-difference signals Cr and Cb at a luminance signal Y.

QCIF formats are one fourth of the amount of information of a CIF format, and sample size is 88 pixel x72 line in 176 pixel x144 line and color-difference signals Cr and Cb at a luminance signal Y.

[0035] The image in a frame is classified into the block of 8 pixel x8 pixel as a component engineering of the compression approach. Coding in a frame which carries out a 2-dimensional discrete cosine transform (DCT conversion) to the block, The interframe coding which takes inter-frame difference and carries out 2-dimensional DCT conversion to the block of the homotopic of a before frame and the present frame, The motion compensation which reduces the amount of generating signs by compensating a motion of an inter-frame image, The zero run length coding using generally a zero value continuing in a RF field with a DCT transform coefficient, The quantization which changes quantization step size according to the yield of data, Variable length coding which assigns a sign value long to a data pattern with low occurrence frequency to a data pattern with high occurrence frequency for a short sign value, And piece dropping [which skips a frame] is adopted, high compressibility is attained in such combination, and video transmission in the channel of a low rate is made possible.

[0036] Since interframe coding (INTER) mode can attain high compressibility when inter-frame correlation is high, when inter-frame has the correlation more than fixed, INTER mode is used for it, and the coding (INTRA) mode in a frame is used for it at the time of under fixed correlation.

[0037] Since the quantization error which is a difference between quantization of a transmitting side and quantization of a receiving side is accumulated at a receiving-side terminal in INTER mode, and this becomes remarkable when quantization is coarse, usually INTRA mode is arranged periodically. Also in order to prevent propagation of a transmission error, INTRA mode is periodically arranged per [above-mentioned] block. Especially, like at the time of initiation of pictorial communication, it restricts, when there is no reference image for difference, or when it is a scene change (condition judged that there is no inter-frame correlation on the whole screen because a scene switches), and the whole block in a frame is encoded in a frame. This is called all INTRA processings. By all INTRA processings, a decryption error and a quantization error are canceled and a screen can be refreshed.

[0038] Next, the negotiation and the approach of modification of clearance capacity are explained to an example for an ISDN circuit. In an ISDN circuit, as shown in drawing 2 , call origination is carried out using an out band signal (that is, D channel). As shown in drawing 2 , the communication link by B channel is attained by the call setup from Terminal A to Terminal B, and the response to the terminal A from Terminal B. Although there are D channel, other H0, other H1, etc. as a channel, only B channel explains.

[0039] Thus, using B channel whose communication link was attained, according to advice H.242, as shown in drawing 3 , an in band signaling procedure is performed by B channel, and this assigns the inside of B channel to data division and the control section which controls a communication link. The control by the control section of an in channel is called the Inn channel control. A control bit is needed in B channel for INN channel control, and the frame structure is prescribed by advice H.221.

[0040] The frame structure in B channel for performing Inn channel control is shown in drawing 4 . Drawing 4 shows the multi-framing structure over B channel (64Kbps). As this multi-framing structure is shown in drawing 4 (a) on the basis of one octet / 125 microseconds, one frame shows 80 octets and ** (b) and 1 submulti-framing shows two frames and ** (c), 1 multi-framing turns into 8 submulti-framing. Eight subchannel #1-#8 of 8Kbps are defined in the direction of

a bit.
[0041] However, a transfer rate is set to 6.4Kbps(es) and, only as for subchannel #8, the signal of FAS (Frame Alignment Signal) and BAS (Bit-rate Allocation Signal) is inserted as a control bit. By this FAS and BAS, the Inn channel control of B channel becomes possible.
[0042] In addition, it is used for an FAS ** frame and a multi-framing synchronization. BAS is used for exchange or capacity setting out of the information on clearance capacity required to determine the multiplex approaches, such as a subchannel. Even if especially BAS is during data communication, it can be switched to every submulti-framing (20ms).
[0043] The in band signaling procedure shown in drawing 3 is explained briefly. If B channel will be in the condition which can be communicated, both the terminals A and B will transmit FAS. The clearance capacity at this time is the mode 0 (voice and mode of only FAS and BAS) of an initial state. this -- FAS -- ** -- a partner -- a terminal -- searching -- having -- H . -- 242 -- specifying -- having had -- frame synchronization -- establishment -- conditions -- filling -- having -- if -- drawing 5 -- being shown -- FAS -- inside -- a bit pattern -- A -- " -- zero -- " -- carrying out -- transmitting . It is checked that the partner terminal has established frame synchronization because a terminal receives A= 0.
[0044] Next, the capacity information in the end of a local is transmitted to a partner terminal by BAS, and the capacity of a partner terminal is checked mutually. At this event, if a communication link is mutually possible, the communication link of data will be started. When capacity change overtime is required, after it transmits clearance capacity as a command using BAS similarly and a partner terminal completes setting out of the capacity, the communication link of data is started.
[0045] Transmission and reception get down from the communication link of data independently, and setting out of clearance capacity is also independently performed also for establishment of a synchronization. Therefore, a synchronization may separate only from a uni directional or the classes of data may differ by transmission and reception.
[0046] When the communication link of data is completed and a call is cut, the terminal (drawing 4 the terminal A) of the side to cut makes it the mode 0 first using BAS. Thereby, the Inn channel control of B channel returns to an initial state. Next, as shown in drawing 2 , in the out band procedure of D channel, cutting and release are performed and all communication links are completed.
[0047] Drawing 5 shows the bit pattern in FAS. Bit A shows the existence of a frame synchronization blank, and shows E bits of existence of generating of a CRC error. C1, C2, C3, and C4 are the bits of CRC4. As for N1-N5, the object for numbering of multi-framing, and R1-R4 are channel numbers. TEA is a terminal unit alarm, and when an input signal cannot be answered by failure inside a terminal, it is set to "1."
[0048] Drawing 6 shows the bit pattern in BAS. As shown in drawing 6 R> 6 (a), a high order triplet expresses an attribute and remaining 5 bits of attribute value of the attribute are shown. Drawing 6 (b) shows the content of the attribute. There is parameter value peculiar to for example, a transfer rate value, codec classification, each media, or information etc. in attribute value.
[0049] Drawing 7 , drawing 8 , drawing 9 , drawing 10 , and drawing 11 show the flow chart of characteristic actuation of this example as a whole. Here, the transfer rate which secured X to the information transmission, the transfer rate which deducted the transfer rate which secured Y to the voice data transfer from the transfer rate X, the transfer rate to which Z deducted the transfer rate of

data (LSD, HSD) from the transfer rate Y, and Zp are the transfer rates Z before transmitting capacity change overtime.
[0050] First, as communication link initiation processing, Zp is initialized by X, Y, Z, and0, and the frame number of all the INTRA frames (frame which encoded the whole block in the frame) transmitted at the time of modification of transmitting capacity etc. is set up (S1).
[0051] It investigates whether it is a compound information terminal treating an image, voice, and data (S2), and if it is not a compound information terminal, it will investigate whether it is the audio usual telephone (S3). In the communication link as a telephone (S3), it connects with a partner terminal by the call control in D channel, and (S4) and B channel are connected (S5). The voice section is made into activation status (S6), and a circuit is maintained to cutting actuation (S7). Cutting actuation cuts (S7) and a circuit (S8). In addition, when there is also no telephone (S3), other terminal treatment is performed (S9).
[0052] In the case of a compound information terminal (S2), it connects with a partner terminal by the call control in D channel (S10), and B channel is connected (S11). The Inn channel control of B channel is started (S12), and an FAS synchronization is detected (S13). If an FAS synchronization is established (S13), the capacity of a partner terminal will be checked by the negotiation of the capacity by BAS (S14).
[0053] If voice capacity is in a partner terminal (S15), the voice section will be started according to the voice Request to Send by the operator (S16) (17 S 18). The transfer rate A of voice data is subtracted from the transfer rate X of secured B channel (S19), and it investigates whether it is possible whether Y which it is as a result of subtraction is forward, and an image, i.e., data, to transmit (S20). If Y is not forward (S20), data division and the image coding section will be stopped (S21), and it will progress to S49. If Y is forward (S20), the existence of the data capacity of a partner terminal will be distinguished (S25).
[0054] When there is no voice capacity in a partner terminal (S15), or when there is no voice Request to Send by the operator (S16), the voice section is stopped (22 S 23) and X is substituted for Y (S24). That is, the transfer rate X of secured B channel is assigned to an image and data transfers. Then, the existence of the data capacity of a partner terminal is distinguished (S25).
[0055] If data capacity is in a partner terminal (S25), data division will be started according to the data Request to Send by the operator (S26) (27 S 25). The data transfer rate B is subtracted from the transfer rate Y which can be used (S29), and it investigates whether it is possible to transmit whether Z which it is as a result of subtraction is forward, and an image (S30). If Z is not forward (S30), the image coding section will be stopped (S31) and it will progress to S49. If Z is forward (S30), the existence of the image capacity of a partner terminal will be distinguished (S35).
[0056] When there is no data capacity in a partner terminal (S25), or when there is no data Request to Send by the operator (S26), data division are stopped (32 S 33) and Y is substituted for Z (S34). That is, the transfer rate Y which can be used is assigned to an image transfer. Then, the existence of the image capacity of a partner terminal is distinguished (S35).
[0057] If image capacity is in a partner terminal (S35), the image coding section will be started according to the image Request to Send by the operator (S36) (37 S 38). If it investigates whether an image transfer rate has modification by the comparison of Z and Zp (S39) and there is Z!=Zp, i.e., modification, (S39), convention frame number transmission of all the INTRA frames is carried out (40 S

41), Zp will be updated by Z (S42) and coding processing of the image information will usually be carried out after this at a passage (S43). the case where there is no modification in an image transfer rate -- (S39) -- coding processing of the image information is usually carried out at a passage (S43). It progresses to S46 after S43.

[0058] When there is no image Request to Send by the operator (S36), the image coding section is stopped (44 S 45).

[0059] If modification of capacity is notified to a partner terminal (S47) and the content of modification has the addition of B channel when there is no image capacity in a partner terminal (S35), and there is a change request of transfer capacity from an operator (S46) (S53), connection of B channel will be added (S54), if there is a cutback of B channels (S55), connection of B channel will be reduced (S56) and S14 or subsequent ones will be repeated henceforth.

[0060] There is a disconnect request (S48), and if it is a thing from a partner terminal (S49), according to advice of transition, it will change in the mode 0 to the mode 0 by the BAS command from a partner terminal in which only voice is treated (S50). Moreover, if a disconnect request is a thing from the end of a local (S49), the BAS command will notify the transition to the mode 0 to a partner terminal, and the end of a local will be made into the mode 0 (S51). S -- cutting processing of a circuit is performed by the D channel control after 50 and 51 (S52).

[0061] Especially a receiving-side terminal does not need to be conscious of the above-mentioned actuation of a transmitting-side terminal, and does not need to add a specific function to a receiving-side terminal.

[0062] At this example, even if turbulence of an image stops arising and it is generated by S39-42 also at the time of modification of an image transfer rate, it will restore in a **** short time.

[0063]

[Effect of the Invention] According to this invention, even if there is modification of a picture transmission rate, turbulence of a transmission image can be controlled substantially and a transmission image is restored at an early stage, so that he can understand easily from the above explanation. Moreover, since a transmitting-side terminal is only controlled by advice within the limits, there is an advantage that it can communicate with all the accepting stations based on advice.

[Translation done.]

* NOTICES *

JPO and NCIPI are not responsible for any
damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

TECHNICAL FIELD

[Industrial Application] More specifically, this invention relates to the image sending set in picture transmission systems, such as a TV phone and a television conference, about an image sending set.

[Translation done.]

* NOTICES *

JPO and NCIPI are not responsible for any
damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is outline configuration block drawing of one example of this invention.
[Drawing 2] It is drawing showing the procedure of cutting from setting out of a call.
[Drawing 3] It is drawing showing the Inn channel-control procedure.
[Drawing 4] H. It is the explanatory view of the frame structure of 221.
[Drawing 5] It is FAS bit pattern drawing.
[Drawing 6] It is bit pattern drawing of BAS.
[Drawing 7] It is a part of operation flow chart of this example.
[Drawing 8] It is a part of operation flow chart of this example.
[Drawing 9] It is a part of operation flow chart of this example.
[Drawing 10] It is a part of operation flow chart of this example.
[Drawing 11] It is a part of operation flow chart of this example.
[Description of Notations]
10: Camera 14: Paintings-and-calligraphic-works camera 16: Image display device 18: Image I/O circuit
22: image coding-network 38:data-terminal 40: -- data interface 42 -- :system control circuit 44:manual operating device 46:circuit interface 46a and a 46 b:gate circuit [ ] -- 46 c:communications control circuit 48 -- :separation multiplexing circuit 50:image transfer rate calculation circuit 52: -- a total -- an INTRA control circuit A 24:images decryption circuit 26: -- a hand set 28: -- a microphone 30: -- a loudspeaker A 32:voice-input/output interface 34:voice coding network 36:voice decryption circuit

---

[Translation done.]

* NOTICES *

JPO and NCIPI are not responsible for any
damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

EXAMPLE

[Example] Hereafter, the example of this invention is explained with reference to a drawing.

[0016] Drawing 1 shows outline configuration block drawing of the terminal unit in one example of this invention.

[0017] In drawing 1 , the camera with which 10 photos a board participant, the paintings-and-calligraphic-works camera with which 14 photos records, such as a drawing, the image display device with which 16 consists of CRT, a liquid crystal display, etc., and 18 are image I/O circuits which choose the output image of cameras 10 and 14 as transmission, carry out selection composition of the output image and receiving image of cameras 10 and 14, and are supplied to an image display device 16.

[0018] The image coding network which encodes the picture signal which 22 should transmit, and 24 are image decryption circuits which decrypt the received coded-image signal. Here, the image coding network 22 carries out the band compression of the image data to the inside of the frame which uses a discrete cosine transform (DCT), vector quantization, and a motion compensation, and between coding and a list by piece dropping. There is CCITT advice H.261 as a coding method which can be transmitted by 64Kbps(es) of the basic interface of an ISDN circuit.

[0019] The hand set with which 26 consists of a microphone and a loudspeaker, and 28 are the voice-input/output interfaces to as opposed to [as opposed to / in a microphone and 30 / a loudspeaker] a hand set 26, a microphone 28, and a loudspeaker 30 in 32. The voice-input/output interface 32 not only switches the voice input/output of a hand set 26, a microphone 28, and a loudspeaker 30, but performs generation processing of tones, such as a dial tone, ringing tone, a busy tone, and a ringer tone, in echo cancellation processing and a list.

[0020] The voice coding network which encodes the sound signal which 34 should transmit from the voice-input/output interface 32, and 36 are voice decryption circuits which decrypt the received coding sound signal and are outputted to the voice-input/output interface 32. There are PCM (A-law) of 64Kbps, PCM (micro-law) of 64Kbps, a 7kHz audio (SB-ADPCM), ADPCM of 32Kbps, 16Kbps (for example, LD-CELP), 8Kbps(es), etc. in transmission speed and the coding approach.

[0021] It is a data interface for 38 to connect Data Terminal Equipments, such as a personal computer, and for 40 connect Data Terminal Equipment 38 concerned.

[0022] The system control circuit where 42 controls the whole, and 44 are manual operating devices which input various directions into the system control circuit 42, for example, it consists of pointing equipments, such as a keyboard, a touch panel, a digitizer, and a mouse.

[0023] 46 the circuit interface of a communication line (for example, ISDN circuit) and 48 While multiplexing the control information from the system control circuit 42 to H.221 format at the information list which should transmit

from the image coding network 22, the voice coding network 34, and the data interface 40 and supplying the circuit interface 46 It is the separation multiplexing circuit which separates an image, voice, data, and a control signal from the receipt information supplied from the circuit interface 46, and is supplied to the image decryption circuit 24, the voice decryption circuit 36, the data interface 40, and the system control circuit 42, respectively.
[0024] In this example, the circuit interface 46 possesses gate circuit 46a for one channel B1 of two B channels, gate circuit 46b for channel B-2 of another side, and communications control circuit 46c that controls a communication link through D channel.
[0025] Moreover, especially the system control circuit 42 possesses the image transfer rate calculation circuit 50 which computes the transfer rate assigned to image data, and all the INTRA control circuits 52 that force coding in a frame of the whole block of one frame. The detail of an operation of the image transfer rate calculation circuit 50 and all the INTRA control circuits 52 is mentioned later.
[0026] The flow of the picture signal in the example shown in drawing 1 and a sound signal is explained briefly. The input image with a camera 10 and the paintings-and-calligraphic-works camera 14 is chosen by the image I/O circuit 18, and is impressed to the image coding network 22. The image coding network 22 encodes an input picture signal in the coding mode in which a control signal and internal decision are followed from the system control circuit 42, and outputs it to the separation multiplexing circuit 48.
[0027] On the other hand, the input sound signal with the microphone or microphone 28 of a hand set 26 is inputted into the voice coding network 34 through the voice-input/output interface 32, and it encodes here and it is inputted into the separation multiplexing circuit 48.
[0028] Data to transmit from a data terminal 38 are inputted into the separation multiplexing circuit 48 through the data interface 40. Moreover, the data inputted from the manual operating device 44 to transmit are also inputted into the separation multiplexing circuit 48 through the data interface 40.
[0029] The separation multiplexing circuit 48 multiplexes the control command from the system control circuit 42 in the coded signal from the image coding network 22 and the voice coding network 34, the data from the data interface 40, and a list, and outputs it to the circuit interface 46. The circuit interface 46 outputs the signal from the separation multiplexing circuit 48 to the communication line to connect in a predetermined format.
[0030] The signal received from the communication line is supplied to the separation multiplexing circuit 48 from the circuit interface 46. The separation multiplexing circuit 48 separates a coded-image signal, a coding sound signal, data, and control command from an input signal, and inputs them into the image decryption circuit 24, the voice decryption circuit 36, the data interface 40, and the system control circuit 42, respectively.
[0031] The image decryption circuit 24 decodes the coded-image signal from the separation multiplexing circuit 48, and inputs it into the image I/O circuit 18. The image I/O circuit 18 carries out selection composition, and inputs the image from cameras 10 and 14, and the receiving image from the image decryption circuit 24 into an image display device 16. The image I/O circuit 18 performs for example, a picture Inn picture, fitting to the response window in a window display system, etc. as synthetic processing. Thereby, an input image and/or a receiving image are displayed on the screen of an image display device 16.
[0032] The receiving sound signal decoded by the voice coding network 36 is impressed to the loudspeaker and/or loudspeaker 30 of a hand set 26 through the

voice-input/output interface 32. Thereby, the voice from a communications partner can be heard.
[0033] The received data separated in the separation multiplexing circuit 48 are inputted into a data terminal 38 from the data interface 40.
[0034] By H.261 advice, in order to enable the communication link between the specification of plurality, such as NTSC system, a PAL system, and a digital television signal, the common video format is specified. They are a CIF format and a QCIF format. The sample size of a CIF format is 176 pixel x144 line in 352 pixel x288 line and color-difference signals Cr and Cb at a luminance signal Y. QCIF formats are one fourth of the amount of information of a CIF format, and sample size is 88 pixel x72 line in 176 pixel x144 line and color-difference signals Cr and Cb at a luminance signal Y.
[0035] The image in a frame is classified into the block of 8 pixel x8 pixel as a component engineering of the compression approach. Coding in a frame which carries out a 2-dimensional discrete cosine transform (DCT conversion) to the block, The interframe coding which takes inter-frame difference and carries out 2-dimensional DCT conversion to the block of the homotopic of a before frame and the present frame, The motion compensation which reduces the amount of generating signs by compensating a motion of an inter-frame image, The zero run length coding using generally a zero value continuing in a RF field with a DCT transform coefficient, The quantization which changes quantization step size according to the yield of data, Variable length coding which assigns a sign value long to a data pattern with low occurrence frequency to a data pattern with high occurrence frequency for a short sign value, And piece dropping [which skips a frame] is adopted, high compressibility is attained in such combination, and video transmission in the channel of a low rate is made possible.
[0036] Since interframe coding (INTER) mode can attain high compressibility when inter-frame correlation is high, when inter-frame has the correlation more than fixed, INTER mode is used for it, and the coding (INTRA) mode in a frame is used for it at the time of under fixed correlation.
[0037] Since the quantization error which is a difference between quantization of a transmitting side and quantization of a receiving side is accumulated at a receiving-side terminal in INTER mode, and this becomes remarkable when quantization is coarse, usually INTRA mode is arranged periodically. Also in order to prevent propagation of a transmission error, INTRA mode is periodically arranged per [above-mentioned] block. Especially, like at the time of initiation of pictorial communication, it restricts, when there is no reference image for difference, or when it is a scene change (condition judged that there is no inter-frame correlation on the whole screen because a scene switches), and the whole block in a frame is encoded in a frame. This is called all INTRA processings. By all INTRA processings, a decryption error and a quantization error are canceled and a screen can be refreshed.
[0038] Next, the negotiation and the approach of modification of clearance capacity are explained to an example for an ISDN circuit. In an ISDN circuit, as shown in drawing 2 , call origination is carried out using an out band signal (that is, D channel). As shown in drawing 2 , the communication link by B channel is attained by the call setup from Terminal A to Terminal B, and the response to the terminal A from Terminal B. Although there are D channel, other H0, other H1, etc. as a channel, only B channel explains.
[0039] Thus, using B channel whose communication link was attained, according to advice H.242, as shown in drawing 3 , an in band signaling procedure is performed by B channel, and this assigns the inside of B channel to data division and the control section which controls a communication link. The control by the control

section of an in channel is called the Inn channel control. A control bit is needed in B channel for INN channel control, and the frame structure is prescribed by advice H.221.

[0040] The frame structure in B channel for performing Inn channel control is shown in drawing 4 . Drawing 4 shows the multi-framing structure over B channel (64Kbps). As this multi-framing structure is shown in drawing 4 (a) on the basis of one octet / 125 microseconds, one frame shows 80 octets and ** (b) and 1 submulti-framing shows two frames and ** (c), 1 multi-framing turns into 8 submulti-framing. Eight subchannel #1-#8 of 8Kbps are defined in the direction of a bit.

[0041] However, a transfer rate is set to 6.4Kbps(es) and, only as for subchannel #8, the signal of FAS (Frame Alignment Signal) and BAS (Bit-rate Allocation Signal) is inserted as a control bit. By this FAS and BAS, the Inn channel control of B channel becomes possible.

[0042] In addition, it is used for an FAS ** frame and a multi-framing synchronization. BAS is used for exchange or capacity setting out of the information on clearance capacity required to determine the multiplex approaches, such as a subchannel. Even if especially BAS is during data communication, it can be switched to every submulti-framing (20ms).

[0043] The in band signaling procedure shown in drawing 3 is explained briefly. If B channel will be in the condition which can be communicated, both the terminals A and B will transmit FAS. The clearance capacity at this time is the mode 0 (voice and mode of only FAS and BAS) of an initial state. this -- FAS -- ** -- a partner -- a terminal -- searching -- having -- H . -- 242 -- specifying -- having had -- frame synchronization -- establishment -- conditions -- filling -- having -- if -- drawing 5 -- being shown -- FAS -- inside -- a bit pattern -- A -- " -- zero -- " -- carrying out -- transmitting . It is checked that the partner terminal has established frame synchronization because a terminal receives A= 0.

[0044] Next, the capacity information in the end of a local is transmitted to a partner terminal by BAS, and the capacity of a partner terminal is checked mutually. At this event, if a communication link is mutually possible, the communication link of data will be started. When capacity change overtime is required, after it transmits clearance capacity as a command using BAS similarly and a partner terminal completes setting out of the capacity, the communication link of data is started.

[0045] Transmission and reception get down from the communication link of data independently, and setting out of clearance capacity is also independently performed also for establishment of a synchronization. Therefore, a synchronization may separate only from a uni directional or the classes of data may differ by transmission and reception.

[0046] When the communication link of data is completed and a call is cut, the terminal (drawing 4 the terminal A) of the side to cut makes it the mode 0 first using BAS. Thereby, the Inn channel control of B channel returns to an initial state. Next, as shown in drawing 2 , in the out band procedure of D channel, cutting and release are performed and all communication links are completed.

[0047] Drawing 5 shows the bit pattern in FAS. Bit A shows the existence of a frame synchronization blank, and shows E bits of existence of generating of a CRC error. C1, C2, C3, and C4 are the bits of CRC4. As for N1-N5, the object for numbering of multi-framing, and R1-R4 are channel numbers. TEA is a terminal unit alarm, and when an input signal cannot be answered by failure inside a terminal, it is set to "1."

[0048] Drawing 6 shows the bit pattern in BAS. As shown in drawing 6 R> 6 (a), a

high order triplet expresses an attribute and remaining 5 bits of attribute value of the attribute are shown. Drawing 6 (b) shows the content of the attribute. There is parameter value peculiar to for example, a transfer rate value, codec classification, each media, or information etc. in attribute value.

[0049] Drawing 7 , drawing 8 , drawing 9 , drawing 10 , and drawing 11 show the flow chart of characteristic actuation of this example as a whole. Here, the transfer rate which secured X to the information transmission, the transfer rate which deducted the transfer rate which secured Y to the voice data transfer from the transfer rate X, the transfer rate to which Z deducted the transfer rate of data (LSD, HSD) from the transfer rate Y, and Zp are the transfer rates Z before transmitting capacity change overtime.

[0050] First, as communication link initiation processing, Zp is initialized by X, Y, Z, and0, and the frame number of all the INTRA frames (frame which encoded the whole block in the frame) transmitted at the time of modification of transmitting capacity etc. is set up (S1).

[0051] It investigates whether it is a compound information terminal treating an image, voice, and data (S2), and if it is not a compound information terminal, it will investigate whether it is the audio usual telephone (S3). In the communication link as a telephone (S3), it connects with a partner terminal by the call control in D channel, and (S4) and B channel are connected (S5). The voice section is made into activation status (S6), and a circuit is maintained to cutting actuation (S7). Cutting actuation cuts (S7) and a circuit (S8). In addition, when there is also no telephone (S3), other terminal treatment is performed (S9).

[0052] In the case of a compound information terminal (S2), it connects with a partner terminal by the call control in D channel (S10), and B channel is connected (S11). The Inn channel control of B channel is started (S12), and an FAS synchronization is detected (S13). If an FAS synchronization is established (S13), the capacity of a partner terminal will be checked by the negotiation of the capacity by BAS (S14).

[0053] If voice capacity is in a partner terminal (S15), the voice section will be started according to the voice Request to Send by the operator (S16) (17 S 18). The transfer rate A of voice data is subtracted from the transfer rate X of secured B channel (S19), and it investigates whether it is possible whether Y which it is as a result of subtraction is forward, and an image, i.e., data, to transmit (S20). If Y is not forward (S20), data division and the image coding section will be stopped (S21), and it will progress to S49. If Y is forward (S20), the existence of the data capacity of a partner terminal will be distinguished (S25).

[0054] When there is no voice capacity in a partner terminal (S15), or when there is no voice Request to Send by the operator (S16), the voice section is stopped (22 S 23) and X is substituted for Y (S24). That is, the transfer rate X of secured B channel is assigned to an image and data transfers. Then, the existence of the data capacity of a partner terminal is distinguished (S25).

[0055] If data capacity is in a partner terminal (S25), data division will be started according to the data Request to Send by the operator (S26) (27 S 25). The data transfer rate B is subtracted from the transfer rate Y which can be used (S29), and it investigates whether it is possible to transmit whether Z which it is as a result of subtraction is forward, and an image (S30). If Z is not forward (S30), the image coding section will be stopped (S31) and it will progress to S49. If Z is forward (S30), the existence of the image capacity of a partner terminal will be distinguished (S35).

[0056] When there is no data capacity in a partner terminal (S25), or when there

is no data Request to Send by the operator (S26), data division are stopped (32 S 33) and Y is substituted for Z (S34). That is, the transfer rate Y which can be used is assigned to an image transfer. Then, the existence of the image capacity of a partner terminal is distinguished (S35).

[0057] If image capacity is in a partner terminal (S35), the image coding section will be started according to the image Request to Send by the operator (S36) (37 S 38). If it investigates whether an image transfer rate has modification by the comparison of Z and Zp (S39) and there is Z!=Zp, i.e., modification, (S39), convention frame number transmission of all the INTRA frames is carried out (40 S 41), Zp will be updated by Z (S42) and coding processing of the image information will usually be carried out after this at a passage (S43). the case where there is no modification in an image transfer rate -- (S39) -- coding processing of the image information is usually carried out at a passage (S43). It progresses to S46 after S43.

[0058] When there is no image Request to Send by the operator (S36), the image coding section is stopped (44 S 45).

[0059] If modification of capacity is notified to a partner terminal (S47) and the content of modification has the addition of B channel when there is no image capacity in a partner terminal (S35), and there is a change request of transfer capacity from an operator (S46) (S53), connection of B channel will be added (S54), if there is a cutback of B channels (S55), connection of B channel will be reduced (S56) and S14 or subsequent ones will be repeated henceforth.

[0060] There is a disconnect request (S48), and if it is a thing from a partner terminal (S49), according to advice of transition, it will change in the mode 0 to the mode 0 by the BAS command from a partner terminal in which only voice is treated (S50). Moreover, if a disconnect request is a thing from the end of a local (S49), the BAS command will notify the transition to the mode 0 to a partner terminal, and the end of a local will be made into the mode 0 (S51). S -- cutting processing of a circuit is performed by the D channel control after 50 and 51 (S52).

[0061] Especially a receiving-side terminal does not need to be conscious of the above-mentioned actuation of a transmitting-side terminal, and does not need to add a specific function to a receiving-side terminal.

[0062] At this example, even if turbulence of an image stops arising and it is generated by S39-42 also at the time of modification of an image transfer rate, it will restore in a **** short time.

[Translation done.]

* NOTICES *

JPO and NCIPI are not responsible for any
damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

OPERATION

[Function] With the above-mentioned means, if there is modification of a picture transmission rate, the screen of a predetermined number will compress the whole screen by the coding method encoded in a screen, and it is transmitted. Thereby, a receiving-side terminal can decode and display a receiving image immediately after modification of a picture transmission rate, without referring to a before screen. Even if turbulence of the image accompanying modification of a picture transmission rate stops almost arising and it generates by this, it recovers in a **** short time.

[Translation done.]

* NOTICES *

JPO and NCIPI are not responsible for any
damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

MEANS

[Means for Solving the Problem] The coding means which the image sending set concerning this invention is an image sending set which carries out compression transmission of the image information with the coding method which has coding in a screen, and coding between screens, and carries out compression coding of the image information which should transmit, It is characterized by consisting of a transmission rate detection means to detect modification of a picture transmission rate, and a control means which makes the screen of the predetermined number after transmission rate modification encode according to the detection result of the transmission rate detection means concerned by the coding method which encodes the whole screen in a screen for the coding means concerned.

[Translation done.]

* NOTICES *

JPO and NCIPI are not responsible for any
damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] At TV telephone or a television conference, mutual control information is multiplexed and transmitted to an image, voice, and a data list if needed. Therefore, when there is modification of the information to transmit and its coding approach, a multiplexing configuration will be changed each time.

[0010] Since modification of a transmission rate is transmitted to an accepting station by the Inn channel-control command of B channel, it is dramatically difficult for it to take the synchronization with transmission information. If the multiplexing modification stage of a transmit terminal and the multiplexing modification stage of an accepting station cross, a decode error will occur with an accepting station.

[0011] especially in the case of image data, it explained previously -- as -- one screen -- the block of a certain arbitration -- dividing -- the block of every -- the difference of a before frame -- with the interframe coding (INTER) which encodes and transmits a value Since coding (INTRA) in a frame encoded within one frame is used together, even if it can take frame synchronization once frame synchronization is confused, by the receiving side, a subject-copy image cannot be restored until it receives the new coding screen in a frame to all the above-mentioned blocks. That is, when there was modification of a picture transmission rate, in a receiving side, there was a fault of taking most time amount before carrying out the repeat display of the normal image.

[0012] This invention aims at showing the image sending set which such inconvenience does not produce.

[Translation done.]

* NOTICES *

JPO and NCIPI are not responsible for any
damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

EFFECT OF THE INVENTION

[Effect of the Invention] According to this invention, even if there is modification of a picture transmission rate, turbulence of a transmission image can be controlled substantially and a transmission image is restored at an early stage, so that he can understand easily from the above explanation. Moreover, since a transmitting-side terminal is only controlled by advice within the limits, there is an advantage that it can communicate with all the accepting stations based on advice.

[Translation done.]

* NOTICES *

JPO and NCIPI are not responsible for any
damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

PRIOR ART

[Description of the Prior Art] by the spread of digital public communication channel networks (the so-called ISDN), an image, voice, and data are instantaneous -- **** -- it becomes possible and a TV phone and a video conference system are becoming realistic. The service convention for voice image service using a digital circuit, protocol specification, and a multimedia multiplexing frame structure convention are announced as advice H.320 of the Consulting Committee of International Telegraph & Telephone (CCITT), H.242, and H.221 grade.

[0003] H.320 specifies the whole system aspect of voice image service. H. 221 specifies the coding assignment of FAS (Frame Alignment Signal) and BAS (Bit-rate Allocation Signal) in voice image transmission on a 64Kbps - 1,920Kbps channel used for a frame structure list by exchange of clearance capacity, assignment of the communicate mode, etc. H. 242 specifies the protocol of the capacity exchange between the terminals by BAS, and a communicate mode change.

[0004] After being synchronous established [which is depended FAS] by the in channel, the approach procedures, such as an exchange sequence of the clearance capacity by BAS and a mode change sequence by assignment of the communicate mode, perform the compound information communication link of an image, voice, data, etc. between terminals by the in channel is prescribed to setting out of the physical connection of end to end, and a list by the above-mentioned advice again.

[0005] or [in addition, / that which communicate mode is used for each terminal within the limits of the capacity to have embraced the situation, to be able to change or choose self clearance capacity now in the predetermined range, and it to have been exchanged] -- a convention -- being out of range .

[0006] About the transmission speed of each information in the case of transmitting an image, voice, and data simultaneously, voice is determined by the coding method of a voice sign, data are set as an assignment value and the remaining transmission capacity in the transmission speed of a communication line is assigned to an image.

[0007] As a compression method of image information, while raising compressibility, the coding method which makes coding in a frame and motion compensation interframe coding intermingled is proposed so that propagation of a transmission error can be suppressed few.

[0008] The digital public network is already put in practical use as ISDN. The interfaces with which the user is provided are a basic interface (2B(64Kbps)+D (16Kbps)) and a primary group interface (H0 (384Kbps), H1 (1.5Mbps), and 23 B+D). A basic interface is replaced with a current analog public network. D channel which is an out band channel is used for call connection with a partner terminal, and B channel is used for transmission of information data, such as voice, an image, and data. Since there are two B channels, the data transfer (bulk

transfer) of 128Kbps becomes possible by the highest by taking the synchronization for these two channels. Since the data transmission capacity of a large quantity is needed by TV telephone, the bulk transfer is dramatically effective.

[Translation done.]